

# Remote Sensing of Environment

*An Interdisciplinary Journal*

---

VOLUME 74, NUMBER 1, OCTOBER 2000

---

## Contents

<i>J. L. Privette, G. P. Asner, J. Conel, K. F. Huemmrich, R. Olson, A. Rango, A. F. Rahman, K. Thome, and E. A. Walter-Shea</i> <b>The EOS Prototype Validation Exercise (PROVE) at Jornada: Overview and Lessons Learned</b>	1
<i>K. M. Havstad, W. P. Kustas, A. Rango, J. C. Ritchie, and T. J. Schmugge</i> <b>Jornada Experimental Range: A Unique Arid Land Location for Experiments to Validate Satellite Systems</b>	13
<i>A. Rango, M. Chopping, J. Ritchie, K. Havstad, W. Kustas, and T. Schmugge</i> <b>Morphological Characteristics of Shrub Coppice Dunes in Desert Grasslands of Southern New Mexico derived from Scanning LIDAR</b>	26
<i>Michael A. White, Gregory P. Asner, Ramakrishna R. Nemani, Jeff L. Privette, and Steven M. Running</i> <b>Measuring Fractional Cover and Leaf Area Index in Arid Ecosystems: Digital Camera, Radiation Transmittance, and Laser Altimetry Methods</b>	45
<i>M. J. Barnsley, P. D. Hobson, A. H. Hyman, W. Lucht, J-P. Muller, and A. H. Strahler</i> <b>Characterizing the Spatial Variability of Broadband Albedo in a Semidesert Environment for MODIS Validation</b>	58
<i>Gregory P. Asner, Carol A. Wessman, C. Ann Bateson, and Jeffrey L. Privette</i> <b>Impact of Tissue, Canopy, and Landscape Factors on the Hyperspectral Reflectance Variability of Arid Ecosystems</b>	69
<i>Wolfgang Lucht, Andrew H. Hyman, Alan H. Strahler, Mike J. Barnsley, Paul Hobson, and Jan-Peter Muller</i> <b>A Comparison of Satellite-Derived Spectral Albedos to Ground-Based Broadband Albedo Measurements Modeled to Satellite Spatial Scale for a Semidesert Landscape</b>	85
<i>Gregory P. Asner and David B. Lobell</i> <b>A Biogeophysical Approach for Automated SWIR Unmixing of Soils and Vegetation</b>	99
<i>Wenge Ni and Xiaowen Li</i> <b>A Coupled Vegetation-Soil Bidirectional Reflectance Model for a Semiarid Landscape</b>	113
<i>Nikolay V. Shabanov, Y. Knyazikhin, Frédéric Baret, and Ranga B. Myneni</i> <b>Stochastic Modeling of Radiation Regime in Discontinuous Vegetation Canopies</b>	125
<i>Wenhan Qin and Siegfried A. W. Gerstl</i> <b>3-D Scene Modeling of Semidesert Vegetation Cover and its Radiation Regime</b>	145
<i>Mark J. Chopping</i> <b>Large-Scale BRDF Retrieval over New Mexico with a Multiangular NOAA AVHRR Dataset</b>	163

## Contents

<i>C. Hu, K. L. Carder, and F. E. Muller-Karger</i> <b>Atmospheric Correction of SeaWiFS Imagery over Turbid Coastal Waters: A Practical Method</b>	195
<i>A. W. Nolin and J. Dozier</i> <b>A Hyperspectral Method for Remotely Sensing the Grain Size of Snow</b>	207
<i>M. Qong</i> <b>Sand Dune Attributes Estimated from SAR Images</b>	217
<i>C. S. T. Daughtry, C. L. Walthall, M. S. Kim, E. Brown de Colstoun, and J. E. McMurtry III</i> <b>Estimating Corn Leaf Chlorophyll Concentration from Leaf and Canopy Reflectance</b>	229
<i>L. Ambrosio Flores and L. Iglesias Martínez</i> <b>Land Cover Estimation in Small Areas Using Ground Survey and Remote Sensing</b>	240
<i>A. N. French, T. J. Schmugge, and W. P. Kustas</i> <b>Discrimination of Senescent Vegetation Using Thermal Emissivity Contrast</b>	249
<i>Baoxin Hu, Kris Inannen, and John R. Miller</i> <b>Retrieval of Leaf Area Index and Canopy Closure from CASI Data over the BOREAS Flux Tower Sites</b>	255
<i>Purushottam Raj Singh and Thian Yew Gan</i> <b>Retrieval of Snow Water Equivalent Using Passive Microwave Brightness Temperature Data</b>	275
<i>Mark J. Chopping</i> <b>Testing a LiSK BRDF Model with in Situ Bidirectional Reflectance Factor Measurements over Semiarid Grasslands</b>	287
<i>H. Yoshioka, T. Miura, A. R. Huete, and B. D. Ganapol</i> <b>Analysis of Vegetation Isolines in Red-NIR Reflectance Space</b>	313

## Contents

<i>William P. Kustas and John M. Norman</i> <b>Evaluating the Effects of Subpixel Heterogeneity on Pixel Average Fluxes</b>	327
<i>I. Chunchuzov, P. W. Vachon, and X. Li</i> <b>Analysis and Modeling of Atmospheric Gravity Waves Observed in RADARSAT SAR Images</b>	343
<i>R. H. Fraser, Z. Li, and J. Cihlar</i> <b>Hotspot and NDVI Differencing Synergy (HANDS): A New Technique for Burned Area Mapping over Boreal Forest</b>	362
<i>J. Pepijn Veeffkind, Gerrit de Leeuw, Piet Stammes, and Robert B. A. Koelmeijer</i> <b>Regional Distribution of Aerosol over Land, Derived from ATSR-2 and GOME</b>	377
<i>S. de Bruin</i> <b>Predicting the Areal Extent of Land-Cover Types Using Classified Imagery and Geostatistics</b>	387

<i>James D. Shepherd and John R. Dymond</i> <b>BRDF Correction of Vegetation in AVHRR Imagery</b>	397
<i>S. Tanahashi, H. Kawamura, T. Matsuura, T. Takahashi, and H. Yusa</i> <b>Improved Estimates of Hourly Insolation from GMS S-VISSR Data</b>	409
<i>Timo Tokola</i> <b>The Influence of Field Sample Data Location on Growing Stock Volume Estimation in Landsat TM-Based Forest Inventory in Eastern Finland</b>	414
<i>Craig G. Gelpi</i> <b>Removing Path-Scattered Radiance from Over-Ocean Spectrometer Images for Water Vapor Estimation</b>	422
<i>Tracey Kenward, Dennis P. Lettenmaier, Eric F. Wood, and Eric Fielding</i> <b>Effects of Digital Elevation Model Accuracy on Hydrologic Predictions</b>	432
<i>Felix N. Kogan</i> <b>Satellite-Observed Sensitivity of World Land Ecosystems to El Niño/La Niña</b>	445
<i>Nan-Jung Kuo, Qunan Zheng, and Chung-Ru Ho</i> <b>Satellite Observation of Upwelling along the Western Coast of the South China Sea</b>	463
<i>S. Jacquemoud, C. Bacour, H. Poilvé, and J.-P. Frangi</i> <b>Comparison of Four Radiative Transfer Models to Simulate Plant Canopies Reflectance: Direct and Inverse Mode</b>	471
<i>Thomas R. Allen and John A. Kupfer</i> <b>Application of Spherical Statistics to Change Vector Analysis of Landsat Data: Southern Appalachian Spruce-Fir Forests</b>	482
<i>Bo-Cai Gao and Rong-Rong Li</i> <b>Quantitative Improvement in the Estimates of NDVI Values from Remotely Sensed Data by Correcting Thin Cirrus Scattering Effects</b>	494
<i>R. S. DeFries and Jonathan Cheung-Wai Chan</i> <b>Multiple Criteria for Evaluating Machine Learning Algorithms for Land Cover Classification from Satellite Data</b>	503
<i>Pascal Matsakis, Serge Andréfouët, and Patrick Capolsini</i> <b>Evaluation of Fuzzy Partitions</b>	516
<i>Dyi-Huey Chang and Shafiqul Islam</i> <b>Estimation of Soil Physical Properties Using Remote Sensing and Artificial Neural Network</b>	534
<i>Brian M. Steele</i> <b>Combining Multiple Classifiers: An Application Using Spatial and Remotely Sensed Information for Land Cover Type Mapping</b>	545
<i>Joachim Hill and Brigitta Schütt</i> <b>Mapping Complex Patterns of Erosion and Stability in Dry Mediterranean Ecosystems</b>	557
<i>Lydia Serrano, Susan L. Ustin, Dar A. Roberts, John A. Gamon, and Josep Peñuelas</i> <b>Deriving Water Content of Chaparral Vegetation from AVIRIS Data</b>	570

*Pablo J. Zarco-Tejada, John R. Miller, Gina H. Mohammed, and Thomas L. Noland*

**Chlorophyll Fluorescence Effects on Vegetation Apparent Reflectance:**

**I. Leaf-Level Measurements and Model Simulation**

582

*Pablo J. Zarco-Tejada, John R. Miller, Gina H. Mohammed, Thomas L. Noland, and Paul H. Sampson*

**Chlorophyll Fluorescence Effects on Vegetation Apparent Reflectance:**

**II. Laboratory and Airborne Canopy-Level Measurements with Hyperspectral Data**

596

*Xiang Gao, Alfredo R. Huete, Wenge Ni, and Tomoaki Miura*

**Optical-Biophysical Relationships of Vegetation Spectra without**

**Background Contamination**

609

**Author Index**

621

**Subject Index**

628

**Volume Contents**

I

---

